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(54) Title: METHOD FOR THE SPATIALLY RESOLVED DETERMINATION OF PHYSICAL, CHEMICAL AND/OR BIOLOGICAL PROPERTIES OR STATE VARIABLES

(57) Abstract: Method for the spatially resolved determination of physical, chemical and/or biological properties or state variables and/or the change therein in an examination area of an examination object by determining the change in the spatial distribution and/or the mobility, particularly the mobility in rotation, of magnetic particles in this examination area or in parts thereof as a function of the effect of physical, chemical and/or biological influencing variables on at least a part-area and/or in the physical, chemical and/or biological conditions in at least a part-area of the examination area, by means of the following steps: a) introducing covered and/or coated magnetic particles with at least one solid, viscous and/or liquid shell or coating into at least part of the examination area and/or introducing magnetic particles into at least part of the examination area and/or covering and/or coating at least some of these particles in the examination area, b) generating a magnetic field with a spatial profile of the magnetic field strength such that there is produced in the examination area a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength, 15 c) changing the, in particular relative, spatial position of the two part-areas in the examination area or changing the magnetic field strength in the first part-area so that the magnetization of the particles is locally changed, d) detecting signals that depend on the magnetization in the examination area that is influenced by this change, and e) evaluating the signals so as to obtain information about the change in the spatial distribution and/or mobility of the magnetic particles in the examination area. The invention also relates to functionalised magnetic particle compositions and magnetic particle compositions suitable for use in the above method. The invention further also relates to an apparatus for the measurement of state variables in the examination area.

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